

## eRD6 MPGD Simulation Notes

4/22/19

Present: Markus, Kondo, Matt P., and Akshath

- Slides for MPGD
  - 1 slide for uRWELL simulation
  - 1 slide for uRWELL cylindrical construction
  - Couple slides on UVa uRWELL beam test results
  - Akshath and Markus may want to include simulation results on how the tracking performance benefits with outer large GEMs included
- uTPC Simulation
  - Implement an overall spatial resolution of 100  $\mu\text{m}$  for each barrel layer for a 1<sup>st</sup> order study of momentum resolution to show at MPGD. This 100  $\mu\text{m}$  is based on INFN uTPC prototype which measured 100  $\mu\text{m}$  or better resolution over a large angular range.
  - Next uTPC steps
    - Kondo suggested to look into GEANT4 determination of number of hit points based on gas material.
    - Next steps would then be to implement estimated hit point resolutions
  - Markus suggested looking at uTPC performance on drift gap size (i.e. 5 mm vs 15 mm) – may influence the electronics that we want to ultimately use.
- Electronics
  - Electronics optimized for detectors such as uTPC and mini-drift MPGDs (GEM-TRD) really need to be developed.
  - Current electronics (APV, SAMPAs) have too slow of a peaking time for the above detector types.
  - Not only eRD6, but also the broader EIC and nuclear/particle physics communities would benefit from these optimized electronics since they are not associated with any one particular detector.
  - eRD6, eRD22, and respected electronics experts should get together and layout what is needed from an optimal electronics setup.
- Readout Foil Stretching
  - Kondo mentioned issues associated with stretching readout foils, in particular readouts that have a fine pitch, ala Compass style readouts.
  - We may want to propose a small R&D effort to quantify the effect of stretching various readout foil patterns with various pitches. We should have this in mind when deciding on the uRWELL readout pattern and how it is installed (stretched or not).